Table 1 continued

Author, date and country	*Patient group*	*Study type (level of evidence)*	*Outcomes*	*Key results*	*Study weaknesses*
Nee P, *et al*, 1999, UK[12]	5416 consecutive patients with head injury, over one year period	Prospective cohort study	Incidence of vomiting in children	12%	Skull fracture is only a proxy outcome for intracranial problems. Methods suggest that additional follow up data were collected, but it is not reported.
			Sensitivity of detecting skull fracture if child and vomiting	33.3%	
			Specificity of detecting skull fracture if child and vomiting	93.3%	
			Likelihood ratio for child and vomiting*	4.9	
Brown FD, *et al*, 2000, UK[13]	563 patients aged 0–13 with minor head injury presenting to a paediatric A+E	Prospective cohort study	Incidence of vomiting	15.8%	Only minor head injury patients included. Not all patients were radiographed or scanned. Very few patients with significant intracranial pathology
			Incidence of skull fracture	<1%	
			Incidence of skull fracture + vomiting	0%	

*Our calculation.

drawn between the identification of skull fracture and intracranial lesions. The identification of skull fracture is in itself a proxy marker for serious injury and cannot be considered a gold standard outcome. Those papers specifically looking at intracranial lesions rather than just skull fractures are also inconclusive.

Clinical bottom line

Vomiting does not seem to be an independent risk factor for skull fracture or intracranial haematoma in the paediatric population.

1 Gorman DF. The utility of post-traumatic skull X-rays. *Arch Emerg Med* 1987;**4**:141–50.
2 Hugenholtz H, Izukawa D, Shear P, *et al*. Vomiting in children following head injury. *Childs Nerv Syst* 1987;**3**:266–70.
3 Chan KH, Yue CP, Mann KS. The risks of intracranial complications in paediatric head injury. *Childs Nerv Syst* 1990;**6**:27–9
4 Ando S, Otani M, Moritake K. Clinical analysis of post-traumatic vomiting. *Acta Neurochir (Wien)* 1992;**119**: 97–100.
5 Dietrich AM, Bowman MJ, Ginn-Pease ME, *et al*. Pediatric head injuries: can clinical factors reliably predict an abnormality on computed tomography. *Ann Emerg Med* 1993;**22**: 1535–40.
6 Duus BR, Boesen T, Kruse KV, *et al*. Prognostic signs in the evaluation of patients with minor head injury. *Br J Surg* 1990;**80**:988–91.
7 Schunk JE, Rodgerson JD, Woodward GA. The utility of head computed tomogrpahic scranning in paediatric patients with normal neurological examination in the emergency department. *Paed Emerg Care* 1996;**12**:160–5.
8 Arienta C, Caroli M, Balbi S. Management of head injured patients in the emergency department: a practical protocol. *Surg Neurol* 1997;**48**:213–19.
9 Hsiang JN, Yeung T, Yu AL, *et al*. High risk mild head injury. *J Neurosurg* 1997;**87**:234–8.
10 Miller EC, Homes JF, Derlet RW. Utilizing clinical factors to reduce head CT scan ordering for minor head trauma patients. *J Emerg Med* 1997;**15**:453–7.
11 Quayle KS, Jaffe DM, Kupperman N, *et al*. Diagnostic testing for acute head injury in children: when are head computed tomography and skull radiographs indicated? *Pediatrics* 1997;**99**:E11.
12 Nee P, Hadfield JM, Yates DW, *et al*. Signficance of vomiting after head injury. *J Neurol Neurosurg Psychiatry* 1999;**66**: 470–3.
13 Brown FD, Brown J, Beattie TF. Why do children vomit after minor head injury? *J Accid Emerg Med* 2000;**17**:268–71.

Low molecular weight heparin or unfractionated heparin in the treatment of patients with uncomplicated deep vein thrombosis

Report by Beverley Lane, *Research Nurse*
Search checked by Magnus Harrison, *Research Fellow*

Clinical scenario

A 60 year old man presents with a three day history of pain in his left calf. You suspect an above knee deep vein thrombosis (DVT), which is later confirmed by ultrasound. You are considering admitting this man for treatment with unfractionated heparin (UH), when one of your colleagues mentions that low weight molecular weight heparins (LMWH) have been proven to be as good at treating thromboembolic disease and its complications. You wonder whether this is true.

Three part question

In [patients with deep vein thrombosis] is [low molecular weight heparin as good as unfractionated heparin} at {treating uncomplicated proximal DVT]?

Search strategy

Medline 1966–07/00 using the OVID interface. (Exp venous thrombosis OR deep vein thrombosis.mp) OR dvt.mp) OR [(exp thrombosis or thrombosis.mp) AND (exp veins OR Vein$.mp)] AND (exp. heparin, low molecular weight OR low molecular weight heparin.mp) NOT (prophylaxis.mp OR primary prevention.mp) LIMIT to human AND english language.

Search outcome

Altogether 373 papers identified of which 369 were irrelevant or of insufficient quality for inclusion. The remaining four papers are shown in table 2.

Comments

There are four well designed trials in this area. All come to the same conclusion.

Clinical bottom line

Low molecular weight heparin is as effective and safe as unfractionated heparin and should be the form of treatment for patients with uncomplicated proximal deep vein thrombosis.

Table 2

Author, date and country	*Patient group*	*Study level*	*Outcomes*	*Key results*	*Study weaknesses*
Hull RD, *et al*, 1992, USA[1]	432 patients with proximal DVT UH (219) *v* LMWH (213)	Multi-centre randomised double blind clinical trial	Recurrence of VTE	6/213 *v* 15/219 (p=0.07; 95% CI for the difference, 0.02% to 8.1%).	
			Major bleeding	1/213 patients (0.5%) *v* 11/219 (5%), reduction in risk of 91% (p=0.006).	
			Death	10/213 (4.7%) *v* 21/219 (9.6%) a risk reduction of 51% (p=0.049).	
Koopman MM, *et al*, 1996, Multi national[2]	400 patients with symptomatic proximal deep vein thrombosis UH in hospital (198) LMWH at home (202)	PRCT	Recurrent VTE (within 6 months)	17/198(8.6%) *v* 14/202 (6.9%).	Unblinded
			Major bleeding (within 3 months)	4/198 *v* 1/202.	
			Quality of life (at 1, 12 and 24 weeks)	Physical activity and social functioning better in LMWH group.	
			Average length of stay	In the LMWH group was 2.7 days *v* 8.1 in the UH group.	
Levine M, *et al*, 1996, Canada[3]	500 patients with acute proximal deep vein thrombosis UH in hospital (253) *v* LMWH primarily at home (247)	PRCT	Recurrent VTE	17/253 (6.7%) *v* 13/247 (5.3%).	Two thirds of potential patients excluded
			Major bleeding	3/253 (2%) *v* 5/247 (2%).	
			Costs	6.5 days in hospital *v* 1.1 days. 120 (49%) patients in LWMH were not admitted at all.	
Belcaro G, *et al*, 1999, Italy[4]	294/589 patients with acute proximal UH in hospital (98) *v* treatment with LMWH primarily at home or in the hospital (97) *v* treatment with SCHep given directly at home (99)	PRCT	Recurrence/extension of DVT	6.2% *v* 6.1% *v* 7.1%.	264 (44%) of potential patients excluded
			Bleeding	Bleeds were all minor and mostly during hospital stay	
			Length of stay	5.4 ± 1.2 *v* 1.2 ± 1.4 days (there was no hospital stay in the SCHep group)	
			Treatment costs	Average treatment costs in 3 months in the UH group were considered to be 100%. In comparison costs in the LMWH group was 28% of the UH and 8% in the SCHep group	

1 Hull R, Raskob G, Pineo G, *et al*. Subcutaneous low weight molecular weight heparin compared with continuous intravenous heparin in the treatment of proximal vein thrombosis. *N Engl J Med* 1992;**326**:975–82.
2 Koopman M, Prandoni P, Piovella F, *et al*. Treatment of venous thrombosis with intravenous unfractionated heparin administered in the hospital as compared with subcutaneous low molecular weight heparin administered at home. *N Engl J Med* 1996;**334**:682–7.
3 Levine M, Gent M, Hirsh J, *et al*. A comparison of low molecular weight heparin administered primarily at home with unfractionated heparin administered in the hospital for proximal vein thrombosis. *N Engl J Med* 1996;**334**:677–81.
4 Belcaro G, Nicolaides A, Cesarone M, *et al*. Comparison of low molecular weight heparin, administered primarily at home, with unfractionated heparin, administered in hospital and subcutaneous heparin administered at home for deep vein thrombosis. *Angiology* 1999;**50**:781–7.

Outpatient treatment for patients with uncomplicated above knee deep vein thrombosis

Report by Beverley Lane, *Research Nurse*
Search checked by Magnus Harrison *Clinical Research Fellow*

Clinical scenario
A 25 year old man presents at the emergency department with a two day history of a swollen and painful right leg. A DVT is suspected and an ultrasound confirms the presence of an extensive clot in the femoral vein. Otherwise he is fit and well. There are no beds in the hospital and you wonder whether the evidence exists to confirm that this patient can be treated safely as an outpatient using low molecular weight heparin.

Three part question
In [patients with an above knee uncomplicated DVT] is [outpatient management with low molecular weight heparin or traditional inpatient management] [feasible and safer]?

Search strategy
Medline 1966–07/00 using the OVID interface. {(Exp venous thrombosis OR deep vein thrombosis.mp OR dvt.mp) OR [(exp thrombosis OR exp venous thrombosis OR thrombosis.mp) AND (exp veins OR Vein$.mp OR vein$.mp)] AND (exp hospitilization OR hospitalisation.mp) OR (inpatient.mp) OR (outpatient.mp OR exp ambulatory care OR ambulatory care.mp) AND (exp heparin OR exp heparin, low molecular weight OR heparin.mp OR exp anticoagulants OR anticoagulants.mp NOT prophylaxis.mp OR exp primary prevention OR prevention.mp)] AND (exp therapeutics OR treatment.mp). LIMIT to human AND english language.

Search outcome
Altogether 493 papers identified of which 485 were irrelevant or of insufficient quality for inclusion. The remaining eight papers are shown in the table 3.

Comments
There are no randomised control trials to answer the question posed. However, all the cohort studies come to the same conclusion.

Clinical bottom line
Selected patients with uncomplicated proximal DVT can be treated safely as outpatients.